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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,770	07/17/2006	Roger Scattergood	K0181.70020US00	1614

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EXAMINER	
HINES, LATOSHA D	
ART UNIT	**PAPER NUMBER**
1797	
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03/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/542,770	SCATTERGOOD, ROGER	
	Examiner	Art Unit	
	LATOSHA HINES	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) *28 and 42* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27,29-41 and 43-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This is the second Office Action based on the 10/542770 application filed on July 17, 2006.

2. Claims 1-46 are pending and have been fully considered. Claims 28 and 42 have been canceled through amendment to claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-27, 29-41, and 43-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over **HAZARIKA et al. (WO 02/00812 A2)** in view of **ALLEN (WO97/44414)**.

With respect to claim 1 HAZARIKA et al. discloses a method for improving the efficiency of combustion processes and/or reducing harmful emissions through composition, tablet, capsule or liquid fuel additive suitable for dispersing a lanthanide (rare earth) oxide in a fuel (page 1 lines 3-6). Preferably, the lanthanide oxide comprises a lanthanide selected from cerium, lanthanum, neodymium and praseodymium. Preferably, the lanthanide oxide is CeO_2 (cerium oxide) (page 4 lines 1-2). The substance used to coat the surface of the lanthanide oxide is preferably a surfactant which is being used as a surface active agent to aid in dispersion. The lipophobic part of the surfactant is embedded into the lanthanide oxide particle, leaving the lipophilic part of the surfactant to interact with the fuel (page 6 lines 2-4). HAZARIKA et al. discloses in addition to the

lanthanide oxide being added to the fuel other materials may be added to the fuel as well. These other materials should all disperse in the fuel. Preferably, the fuel is one suitable for use in an internal combustion engine (paragraph 0033)

With respect to claim 2-5 HAZARIKA et al. discloses other materials may be added to the fuel in addition to the lanthanide oxide such as compounds of **manganese**, **iron**, cobalt, nickel, barium, strontium, **calcium** and lithium (doping) (page 6 lines 21-27).

With respect to claims 6-7 HAZARIKA et al. discloses particles of lanthanide oxide (cerium oxide) added to the fuel are discrete particles. Preferably, the mean particle size of the lanthanide oxide is in the range of **1 nm to 100 microns**. More preferably, the mean particle size is in the range of 1 nm to 5 microns, more preferably **1 nm to 0.5 microns**, more preferably 1 nm to 50 nm, and more preferably 1 nm to 10 nm (page 4 lines 9-14).

With respect to claim 8-11 HAZARIKA et al. discloses surfactants having a low HLB generally more oil soluble than those surfactants having a high HLB. Examples of low HLB surfactants are alkyl carboxylic acids, **anhydrides and esters** having at least one C_{10}-C_{30} alkyl group, such as **dodecenyl succinic anhydride (DDSA)** (dicarboxylic acid anhydride/alkenyl succinic anhydride), stearic acid, oleic acid, sorbitan tristearate and glycerol monostearate (page 6 lines 5-14).

With respect to claim 12 HAZARIKA et al. discloses an internal combustion engine which may be any type including spark ignition engines and compression ignition engines. Similarly, the fuel may be of any type, including petrol/gasoline (both leaded and unleaded), **diesel** and LPG fuel (page 3 lines 2-3).

With respect to claim 13 HAZARIKA et al. discloses an **aromatic hydrocarbon** compound, such as benzene or naphthalene, optionally substituted with one or more C_1-C_6 alkyl group(s) (page 8 lines 2-4).

With respect to claim 17-18 HAZARIKA et al. discloses the substance used to coat the surface of the lanthanide oxide is preferably a surfactant. The lipophobic part of the surfactant is embedded into the lanthanide oxide particle, leaving the lipophilic part of the surfactant to interact with the fuel (page 6 lines 2-4).

With respect to claim 26 and 27 HAZARIKA et al. discloses the amount of lanthanide oxide required will depend on the total surface area of the lanthanide oxide particles and also fuel tank capacity. Preferably, the amount of lanthanide oxide added to the fuel is **1 to 10 ppm** (page 5 lines 2-3 and line 10).

With respect to claim 29 HAZARIKA et al. discloses the substance used to coat the surface of the lanthanide oxide is preferably a surfactant. The lipophobic part of the surfactant is embedded into the lanthanide oxide particle, leaving the lipophilic part of the surfactant to interact with the fuel (page 6 lines 2-4).

With respect to claim 32 HAZARIKA et al. discloses a lanthanide oxide comprising a lanthanide selected from cerium, lanthanum, neodymium and praseodymium. Preferably, the lanthanide oxide is CeO_2 (cerium oxide) (page 4 lines 1-2). The substance used to coat the surface of the lanthanide oxide is preferably a surfactant. The lipophobic part of the surfactant is embedded into the lanthanide oxide particle, leaving the lipophilic part of the surfactant to interact with the fuel (page 6 lines 2-4). Other materials may be added

to the fuel in addition to the lanthanide oxide such as compounds of **manganese**, **iron**, cobalt, nickel, barium, strontium, **calcium** and lithium (page 6 lines 21-27).

With respect to claim 41 HAZARIKA et al. discloses an **aromatic hydrocarbon** compound, such as benzene or naphthalene, optionally substituted with one or more C_1-C_6 alkyl group(s) (page 8 lines 2-4).

With respect to claim 14-16 HAZARIKA et al. discloses the lanthanide oxide may be in the form of a loose powder, tablet, and capsule or liquid fuel additive. These may be dispensed into fuels manually (e.g. by addition to the fuel tank at the time of refueling) or with the aid of a suitable mechanical or electrical dosing device that may be utilized to automatically dose an appropriate amount of lanthanide oxide into the fuel (page 9 lines 13-17). It would have been obvious to add the compound at either of these locations for ease of handling the cerium additive (adding a concentrate) and to ensure thorough mixing of the fuel and additive before introduction of the fuel to the vehicle.

With respect to claims 30 and 31 HAZARIKA et al. discloses the amount of lanthanide oxide is in the range of 1 to 99.99 wt% based on the total weight of the tablet. More preferably, the amount of lanthanide oxide is in the range of 30 to 80 wt% and more preferably 40 to 60 wt. %. More preferably, the amount of lanthanide oxide in the tablet is about 50 wt. % (page 8 lines 6-9). The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (See MPEP 2144).

With respect to claims 1-27, 29-41, and 43-46 HAZARIKA et al. does not teach a cerium oxide wherein a detergent is a succinimide derived from a polyisobutenyl succinic acylating agent and an ethylene polyamine having an average composition from triethylene tetramine to pentaethylene hexamine.

However, with respect to claims 1-27, 29-41, and 43-46 ALLEN discloses a process for adding to the fuel a liner lacquering reducing amount of a fuel-soluble composition comprising a diesel detergent and one combustion improver. The detergent is an imide or amide formed by the reaction of a polyalkene substituted succinic acylating agent and an amine such as ethylene or propylene amine (page 3 lines 10-35). The amount of detergent employed may be sufficient to provide up to 1000 ppm (page 4 lines 20-27). The combustion improver is a rare earth metal oxidic compound, preferably a cerium oxidic compound. Additives such as anti-foams may be incorporated if desired (page 7 lines 4-7).

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the succinimide and various fuel additives of ALLEN in the fuel composition of HAZARIKA et al. because the succinimide and various fuel additives are stable systems that are cooperatively effective in fuels for improving the operation of diesel engine particulate traps as taught by ALLEN (page 2-3).

Therefore, the invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LATOSHA HINES whose telephone number is 571-270-5551. The examiner can normally be reached on Monday thru Thursday from 8 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LATOSHA HINES/
Examiner, Art Unit 1797

/Cephia D. Toomer/
Primary Examiner, Art Unit 1797